2008 BNL MODEL BRIDGE SPECIFICATIONS

1. Materials

a. The bridge must be constructed only from 3/32 square cross-section basswood and any commonly available adhesive.

b. The basswood may be notched, cut, sanded or laminated in any manner.

c. No other materials may be used. Do not paint, stain or coat the bridge with any foreign substance.

2. Construction

a. The bridge mass shall be no greater than 25.0 grams.

b. The bridge (see Figure 1) must span a gap (**S**) of 300 mm, be no longer (**L**) than 400 mm, have a maximum width (**W**) of 80 mm and be no taller (**H**) than 200 mm above the support surfaces.

c. No portion of the bridge structure shall extend below the support surfaces.

d. The loading plane (**P**) shall be horizontal and shall lie no more than 50 mm above the support surfaces. The bridge may extend above the loading plane to the maximum height (see 2 b, above) as long as clearance is provided for the loading plate and the loading rod to allow for loading from above or below.

e. The bridge structure shall be symmetrical about its longitudinal and transverse centerlines.

f. The bridge must be constructed to provide for the loading plate (see section 3, below) at each of the two loading points. Clearance must also be provided for a vertical loading rod at both locations above and below the bridge.

NOTE: Although BNL will load from above the bridge; the International Contest will load from below. Bridge designs that do not have loading rod access from both above and below will be disqualified.

3. Loading

a. The load will be applied downward by means of a 20 mm by 50 mm by 6.35 mm thick plate resting on the bridge loading plane.(see Figure 2). The 12.7 mm diameter loading rod is rigidly attached to the center of the plate.

(Note: the design must also comply with the internal rules where the load will be applied downward, from below, by means of a standard 3/8 inch U-bolt [Home Depot part #030699095568] and its associated rectangular plate of

thickness 2. mm with approximate dimensions of 121. mm x 19. mm (see Figure 3) resting on the loading plane of the bridge. For the international test masses will be supported on a vertical loading rod suspended from the U-bolt.)

b. Two edges of the loading plate will be parallel to the bridge longitudinal axis at the time of load application.

c. The load will be applied on the longitudinal axis of the bridge at one of the two loading points: 50 mm to either side of the center of the 300 mm span.

4. Testing

a. The loading position will be decided by the judges on the day of the contest, and will be the same for all bridges.

b. The model bridge will be centered on the support surfaces.

c. The loading plate will be placed at the chosen position. The load will be applied downward from above as described in section 3.

d. Competition loading will stop at 50 kg, however, loading will continue until bridge failure occurs.

e. Bridge failure is defined as the inability of the structure to carry additional load or a bridge deflection of 25. mm under the loading point, whichever occurs first.

f. The bridge structural efficiency (**E**) will determine the winners:

E=Load supported in grams (50,000g maximum) / Mass of bridge in grams

g. The three bridges with the highest structural efficiencies will be awarded prizes.

5. Qualification

a. All construction and material requirements will be checked prior to testing. Bridges that do not meet the requirements shall be disqualified.

b. If during testing of a bridge, a condition becomes apparent which prevents testing as described, that bridge shall be disqualified.

c. For questions on the preceding rules call 631-344-5963 between 9:00am and 4:00pm EST or email Mel Morris at: mmorris@bnl.gov

d. For rule updates, periodically check the BNL web site:

   http://www.bnl.gov/education/contests/bridge

e. All decisions of the judges are final.